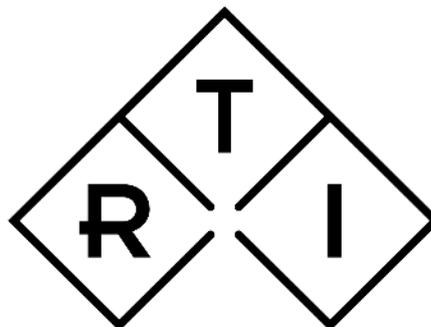


# DETECTOR DATA

## RTI CT Ion Chamber

10 cm & 30 cm



INDEPENDENT X-RAY  
QUALITY ASSURANCE

## GENERAL

The **RTI CT Ion Chamber** and the **RTI CT Ion Chamber 30 cm** are pencil type of ion chambers. They both fulfil applicable parts of the IEC 61674 standard for diagnostic dosimeters, MEDICAL ELECTRICAL EQUIPMENT DOSEMETERS WITH IONIZATION CHAMBERS AND/OR SEMICONDUCTOR DETECTORS AS USED IN RADIOGRAPHY, INCLUDING MAMMOGRAPHY AND FLUOROSCOPY. Thereby it is compatible with IEC 61223-2-6 and 66601-2-44 for applicable CT dosimetry.

The Chambers are compatible with the RTI Chamber Adapter for use with the Piranha and Cobia. They are also compatible with the RTI Barracuda, and Solidose 400.

## TECHNICAL DESCRIPTION

The detector is designed as a traditional pencil type of ion chamber with a central electrode, a guard and a surrounding shield which also serves as outer electrode for the polarizing potential. The detector is designed for an operating polarizing potential of 300 V on the central electrode.

## RTI CT ION CHAMBER (10 CM)

### SPECIFICATIONS

Energy dependence	±1% 70 – 150 kV, with reference point at RQT 9, 120 kV. IEC 61267 radiation qualities: RQR 5 to 10, RQA 5 to 10, and RQT 8 to 10.
Typical conversion factor	30 mGycm/nC
Leakage current	typical $2 \times 10^{-14}$ A
Dimensions (Detector assembly excluding cable)	
Length	150 mm
Outer diameter	12.0 mm (12.6 mm including o-rings)
Active volume	appr. 5.3 cm <sup>3</sup>
Effective Length*	100 mm ±0.5 mm
Rated Length*	85 mm ±1 mm
Cable length	2 m
Weight	Appr. 40 g
Connector type	Triaxial LEMO
Operating temperature and humidity	-10 °C to +50 °C at <85 % relative humidity

Specifications are valid for + 18°C to + 23°C at <80 % relative humidity. All specifications can be altered without notice.

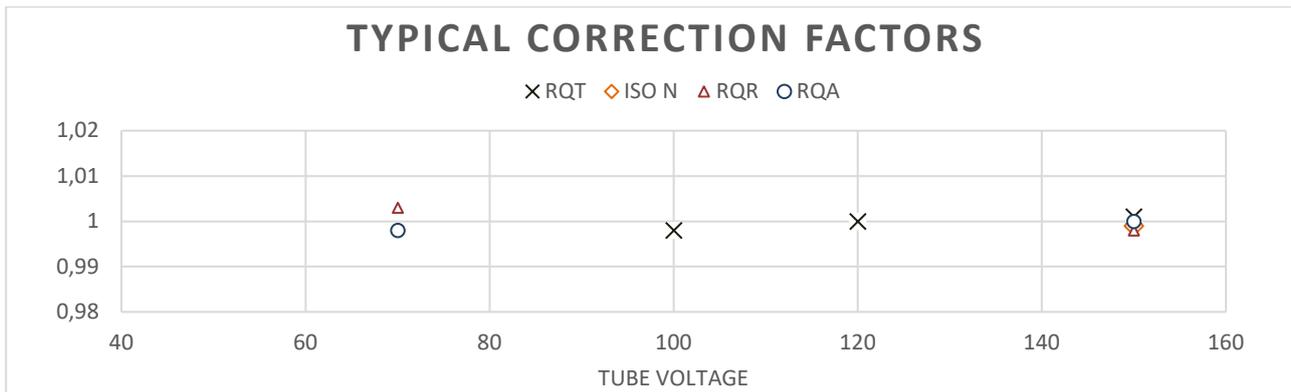
\* Effective length and Rated length as defined in IEC 61674 (Ed.2, 2012).

The effective length is marked with lines on the detector, at the position where the sensitivity of the chamber passes 50% of the sensitivity at centre of the chamber volume.

The rated length is defined within the length where the sensitivity is not less than 97% of the sensitivity at centre of the chamber volume.

## ENERGY DEPENDENCE

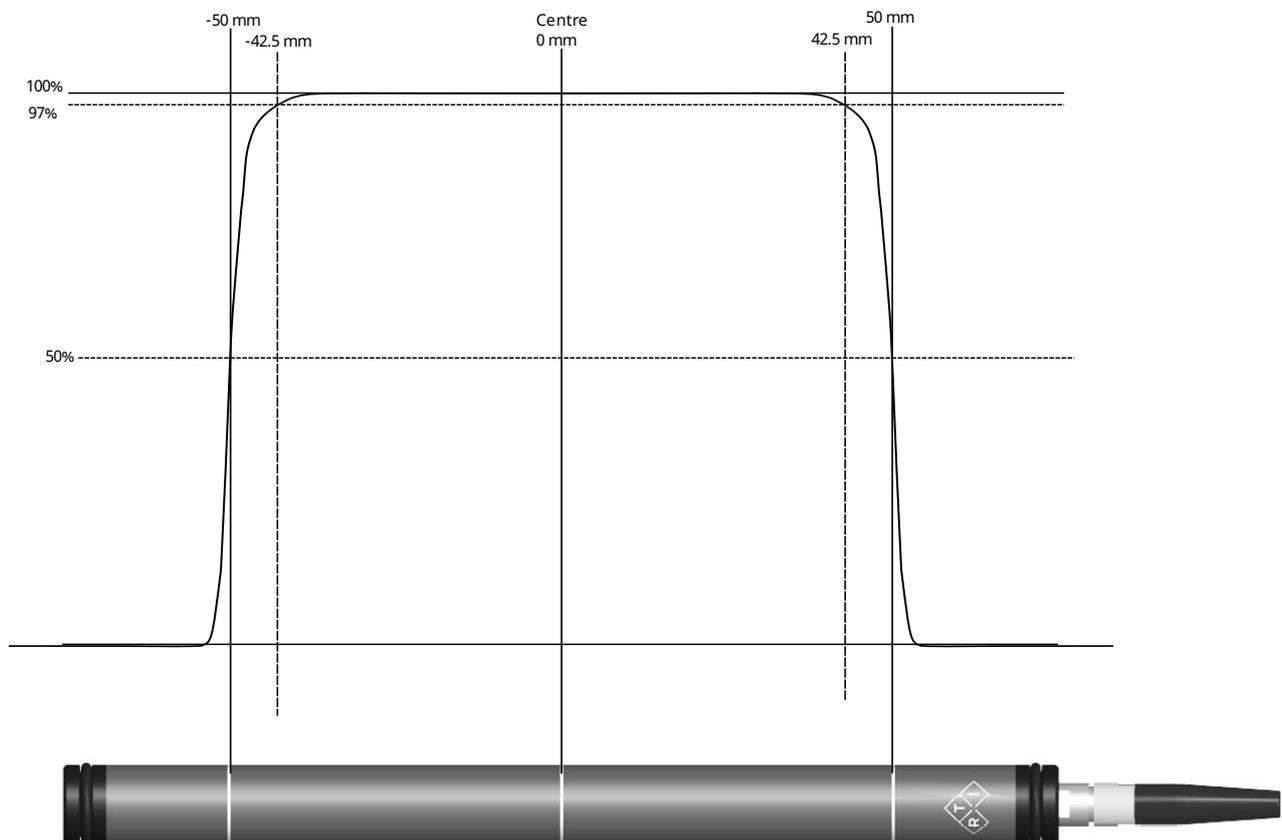
The graph below shows the typical energy dependence for the RTI CT Ion Chamber.



The uncertainty of the typical energy dependence is  $\pm 1\%$  at a confidence interval of 95%.

## EFFECTIVE LENGTH AND RATED LENGTH

The figure below describes the effective length and the rated length of the ion chamber volume.



The effective length and the rated length are given as defined by IEC 61674 (Ed.2, 2012).

Within the rated length (85 mm) the sensitivity is within  $\pm 3\%$  of the sensitivity at the center of the chamber. The effective length is given at the position where the sensitivity is 50% of the sensitivity at the center of the chamber.

The center of the chamber and the effective length are marked on the detector.

The precision and the accuracy of the effective length has a major influence when measure CTDI on wide beams when the chamber is moved to different positions. This is the case when measure at wide slice widths, following the method described in IEC 61223-2-6 and 66601-2-44.

# RTI CT ION CHAMBER 30 CM

## SPECIFICATIONS

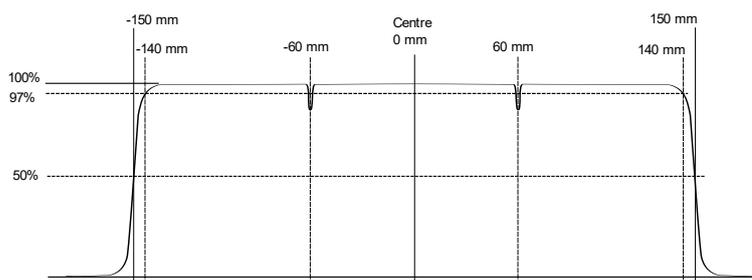
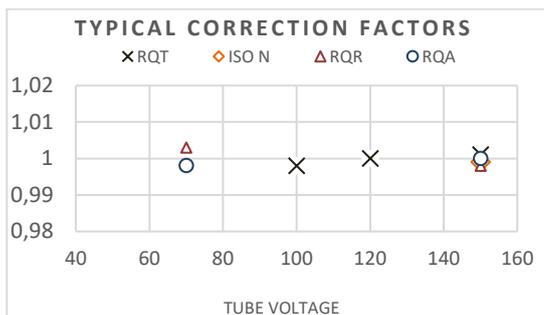
Energy dependence	±1% 70 – 150 kV, with reference point at RQT 9, 120 kV. IEC 61267 radiation qualities: RQR 5 to 10, RQA 5 to 10, and RQT 8 to 10.
Typical conversion factor	30 mGycm/nC
Leakage current	typical $2 \times 10^{-14}$ A
Dimensions (Detector assembly excluding cable)	
Length	350 mm
Outer diameter	12.0 mm (12.6 mm including o-rings)
Active volume	appr. 16 cm <sup>3</sup>
Effective Length*	300 mm ±0.5 mm
Rated Length*	280 mm ±1 mm
Cable length	2 m
Weight	Appr. 50 g
Connector type	Triaxial LEMO
Operating temperature and humidity	-10 °C to +50 °C at <85 % relative humidity

Specifications are valid for + 18°C to + 23°C at <80 % relative humidity. All specifications can be altered without notice.

\* Effective length and Rated length as defined in IEC 61674 (Ed.2, 2012).

The effective length is marked with lines on the detector, at the position where the sensitivity of the chamber passes 50% of the sensitivity at centre of the chamber volume.

The rated length is defined within the length where the sensitivity is not less than 97% of the sensitivity at centre of the chamber volume. At ±60 mm, ±1 mm, from centre there is a small decrease in the sensitivity. The effect of these decreases is less than 1% when the irradiation of the chamber is wider than 120 mm, and no effect when irradiation of less than 120 mm when the radiation field is aligned over the centre of the chamber.



The effective length and the rated length are given as defined by IEC 61674 (Ed.2, 2012).

Within the rated length (280 mm) the sensitivity is within ±3% of the sensitivity at the center of the chamber.

The effective length is given at the position where the sensitivity is 50% of the sensitivity at the center of the chamber.

The center of the chamber and the effective length are marked on the detector.

The precision and the accuracy of the effective length has a major influence when measure CTDI on wide beams when the chamber is moved to different positions. This is the case when measure at wide slice widths, following the method described in IEC 61223-2-6 and 66601-2-44.